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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/592,734	06/13/2000	Fumio Koyama	192909US2	7329
22850	7590	05/16/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			YANG, RYAN R	
			ART UNIT	PAPER NUMBER
			2672	

DATE MAILED: 05/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/592,734

Applicant(s)

KOYAMA, FUMIO

Examiner

Ryan R Yang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,7-10 and 13-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-20 is/are allowed.
- 6) ☒ Claim(s) 1-4,7-10 and 21-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/28/2005 has been entered.
2. This action is responsive to communications: Amendment, filed on 3/28/2005. This action is non-final.
3. Claims 1-4, 7-10 and 13-32 are pending in this application. Claims 1, 7, 13, 17, 21 and 27 are independent claims. In the Amendment, filed on 3/28/2005, claims 1, 7, 21 and 27 were amended
4. The present title of the invention is "Color correction in image display" as filed originally.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 7, 21 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Koyama (5,793,344).

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As per claim 1, Koyama discloses an image display apparatus comprising:

an image processor for outputting image data including plural color component data (Figure 1, item 101 CCD Camera Device is an image processor);

a gain corrector for correcting chromaticity levels of the image data output by the image processor (Figure 1, item 116 Correction Processor is a gain corrector); and

an image display device having pixels each emitting a plurality of colored light rays for forming a color image in accordance with the corrected image data corrected by the gain corrector (Figure 1, item 111 is a display screen displaying corrected image), wherein

the gain corrector corrects a respective level of at least one of the plural color component data applied to each respective pixel in the image display device based on measured luminance levels at each respective pixel such that, when image data representing an image of a uniform color are output from the image processor, a difference in chromaticity of light exiting from the pixels due to characteristics difference between the pixels of the image display device is reduced ("a difference between a desired standard level and a level of a signal input to the signal processor 104 is obtained and then used as a correction value", column 4, line 46-48) without making uniform a luminance of the light exiting from the pixels of the image display device ("Figure 15 shows display information displayed on the active matrix portion 111. The display information includes a small change component but does not include a large change component, so that nonuniformity on a display portion can be inconspicuous", column 6, line 7-11).

7. As per claim 7, Koyama discloses an image display method comprising:

providing image data including plural color component data (Figure 1, item 101 CCD Camera provides image data);

correcting chromaticity levels of the image data (Figure 1, item 116 Correction Processor performs correction); and

producing light representing an image at a plurality of pixels of an image display device, each pixel emitting a plurality of colored light rays for forming a color image in accordance with the corrected image data (Figure 1, item 111 is a display screen displaying corrected image), wherein

the correcting step comprises correcting a respective level of at least one of the plural color component data applied to each respective pixel in the image display device based on measured luminance levels at each respective pixel such that, when image data representing an image of a uniform color are output from the image processor, a difference in a chromaticity of light exiting from the pixels due to characteristic differences between the pixels of the image display device is reduced ("a difference between a desired standard level and a level of a signal input to the signal processor 104 is obtained and then used as a correction value", column 4, line 46-48) without making uniform a luminance of the light exiting from the pixels of the image display device ("Figure 15 shows display information displayed on the active matrix portion 111. The display information includes a small change component but does not include a large change component, so that nonuniformity on a display portion can be inconspicuous", column 6, line 7-11).

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8. As per claim 21, Koyama discloses an image display apparatus comprising:

an image processor for outputting image data including plural color component data (Figure 1, item 101 CCD Camera Device is an image processor);

a gain corrector for correcting chromaticity levels of the image data output by the image processor (Figure 1, item 116 Correction Processor performs correction); and

an image display device having a plurality of pixels each emitting a plurality of colored light rays for forming a color image in accordance with the corrected image data corrected by the gain corrector (Figure 1, item 111 is a display screen displaying corrected image), wherein

the gain corrector corrects a respective level of at least one of the plural color component data applied to each respective pixel in the image display device based on measured luminance levels at each respective pixel such that, when image data representing an image of a uniform color are output from the image processor, a difference in chromaticity of light exiting from the pixels due to characteristic differences between the pixels of the image display device is reduced without making luminance of the light exiting from the pixels of the image display device conform to a desired smooth luminance profile throughout the image display device (Figure 1, item 116 Correction Processor performs correction; "a difference between a desired standard level and a level of a signal input to the signal processor 104 is obtained and then used as a correction value", column 4, line 46-48) and without making uniform a luminance of the light exiting from the pixels of the image display device ("Figure 15 shows display information displayed on the active matrix portion 111. The display information includes

a small change component but does not include a large change component, so that nonuniformity on a display portion can be inconspicuous", column 6, line 7-11).

9. As per claim 27, Koyama discloses an image display method comprising:

providing image data including plural color component data (Figure 1, item 101 CCD Camera provides image data);

correcting chromaticity levels of the image data (Figure 1, item 116 Correction Processor performs correction); and

producing light representing an image at a plurality of pixels of an image display device, each pixel emitting a plurality of colored light rays for forming a color image in accordance with the corrected image data (Figure 1, item 111 is a display screen displaying corrected image), wherein

the correcting step comprises correcting a respective level of at least one of the plural color component data applied to each respective pixel in the image display device based on measured luminance levels at each respective pixel such that, when image data representing an image of a uniform color are output from the image processor, a difference in a chromaticity of light exiting from the pixels due to characteristic differences between the pixels of the image display device is reduced without making luminance of the light exiting from the pixels of the image display device conform to a desired smooth luminance profile throughout the image display device (Figure 1, item 116 Correction Processor performs correction; "a difference between a desired standard level and a level of a signal input to the signal processor 104 is obtained and then used as a correction value", column 4, line 46-48) and without making uniform a luminance of

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the light exiting from the pixels of the image display device ("Figure 15 shows display information displayed on the active matrix portion 111. The display information includes a small change component but does not include a large change component, so that nonuniformity on a display portion can be inconspicuous", column 6, line 7-11).

Claim Rejections - 35 USC § 103

10. Claims 2-4 and 8-10, 22-24, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama et al. (5,793,344) in view Muraji (US 5,260,797).

As per claim 2, Koyama demonstrated all the elements as applied in the rejection of independent claim 1, supra.

Koyama discloses an image display correction device. It is noted that Koyama does not explicitly disclose the gain corrector corrects the chromaticity levels of all but a specific one of the plural color component data applied to the pixels to reduce difference in level between the specific color component data and the other color component data, however, this is known in the art as taught by Muraji et al., hereinafter Muraji. Muraji discloses "The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal" (column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses an image display correction device and Muraji discloses the colors can be individually corrected in order to precisely adjust each color.

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11. As per claim 3, Koyama and Muraji demonstrated all the elements as applied in the rejection of claim 2, *supra*, and Muraji further discloses the specific color component data is a color component data that makes a greatest contribution to the luminance of the light for forming the image ("the green color component signal", column 2, line 55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

12. As per claim 4, Koyama and Muraji demonstrated all the elements as applied in the rejection of claim 3, *supra*, and Muraji further discloses the plural color component data are red, green, and blue component data, and the specific color component data is the green component data ("The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal", column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

13. As per claim 8, Koyama demonstrated all the elements as applied in the rejection of independent claim 7, *supra*.

Koyama discloses a method of correcting image. It is noted that Koyama does not explicitly disclose the step of correcting the level of at least one of the plural color component data includes the step of correcting the levels of all but a specific one of the plural color component data applied to the pixels to reduce difference in level between the specific color component data and the other color component data, however, this is known in the art as taught by Muraji et al., hereinafter Muraji. Muraji discloses "The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal" (column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses a method of correcting image and Muraji discloses the colors can be individually corrected in order to precisely adjust each color.

14. As per claim 9, Koyama demonstrated all the elements as applied in the rejection of dependent claim 8, supra, and Muraji further discloses the specific color component data is a color component data that makes the greatest contribution to the luminance of the light for forming the image ("the green color component signal", column 2, line 55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

15. As per claim 10, Koyama and Muraji demonstrated all the elements as applied in the rejection of dependent claim 9, supra, and Muraji further discloses the plural color component data are red, green, and blue component data, and the specific color component data is the green component data ("The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal", column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

16. As per gain 22, Koyama demonstrated all the elements as applied in the rejection of independent claim 21, supra.

Koyama discloses an image display correction device. It is noted that Koyama does not explicitly disclose the gain corrector corrects the chromaticity levels of all but a specific one of the plural color component data applied to the pixels to reduce difference in level between the specific color component data and the other color component data, however, this is known in the art as taught by Muraji et al., hereinafter Muraji. Muraji discloses "The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal" (column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses an image display correction device and Muraji discloses the colors can be individually corrected in order to precisely adjust each color.

17. As per claim 23, Koyama and Muraji demonstrated all the elements as applied in the rejection of claim 22, supra, and Muraji further discloses the specific color component data is a color component data that makes a greatest contribution to the luminance of the light for forming the image ("the green color component signal", column 2, line 55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

18. As per claim 24, Koyama and Muraji demonstrated all the elements as applied in the rejection of claim 23, supra, and Muraji further discloses the plural color component data are red, green and blue component data, and the specific color component data is the green component data ("The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal", column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama

discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

19. As per claim 28, Koyama demonstrated all the elements as applied in the rejection of independent claim 27, *supra*.

Koyama discloses a method of correcting image. It is noted that Koyama does not explicitly disclose the step of correcting the level of at least one of the plural color component data includes the step of correcting the levels of all but a specific one of the plural color component data applied to the pixels to reduce difference in level between the specific color component data and the other color component data, however, this is known in the art as taught by Muraji et al., hereinafter Muraji. Muraji discloses "The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal" (column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses a method of correcting image and Muraji discloses the colors can be individually corrected in order to precisely adjust each color.

20. As per claim 29, Koyama demonstrated all the elements as applied in the rejection of claim 27, *supra*.

Koyama discloses a method of correcting image. It is noted that Koyama does not explicitly disclose the specific color component data is a color component data that

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makes a greatest contribution to the luminance of the light for forming the image, however, this is known in the art as taught by Muraji. Muraji discloses "the green color component signal" (column 2, line 55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Koyama because Koyama discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

21. Claims 25-26 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama et al. in view of Hideo (JP 11-113019).

22. As per claim 25, Koyama demonstrated all the elements as applied in the rejection of independent claim 21, supra,

Koyama discloses an apparatus for correcting non-uniformity of an image display, it is noted that Koyama does not explicitly disclose correction values for apex pixels corresponding to apexes of the small blocks are determined in advance, and correction values of pixels other than the apex pixels in each small areas are interpolated from the correction values of the apex pixels of the small area, however, this is known in the art as taught by Hideo. Hideo discloses in Figure 10, where the coordinates of the four corner position $G(X_n, Y_n)$ and correction values are entered and correction values are interpolated.

Thus, it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Hideo into Koyama because Koyama discloses an image display

apparatus and Hideo discloses an image correction method by segmenting the display area in order to form a smoother corrected image.

23. As per claim 26, Koyama and Hideo demonstrated all the elements as applied in the rejection of independent claim 25, *supra*, and Hideo further discloses the plurality of pixels are segmented into the plurality of small areas by a horizontal axis passing through a center pixel among the multiple pixels, a vertical axis passing through the center pixel, and defining the sides of a rhombus whose apexes are the extremities of the horizontal axis and the vertical axis (Figure 4, where a square is a special case of a rhombus).

Thus, it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Hideo into Koyama because Koyama discloses an image display apparatus and Hideo discloses an image correction method by segmenting the display area in order to form a smoother corrected image.

24. As per claim 31, Koyama demonstrated all the elements as applied in the rejection of independent claim 27.

Koyama discloses a method for correcting non-uniformity of an image display, it is noted that Koyama does not explicitly disclose the display is segmented and correction values are interpolated from the apex values, however, this is known in the art as taught by Hideo. Hideo discloses an image display correction method in which the plurality of pixels are segmented into a plurality of small areas of polygonal shape (see Figure 4); correction values for apex pixels corresponding to apexes of the small blocks are determined in advance, and correction values of pixels other than the apex pixels in

each small areas are interpolated from the correction values of the apex pixels of the small area (Figure 10, where the coordinates of the four corner position $G(X_n, Y_n)$ and correction values are entered).

Thus, it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Hideo into Koyama because Koyama discloses an image display apparatus and Hideo discloses an image correction method by segmenting the display area in order to form a smoother corrected image.

25. As per claim 32, Koyama and Hideo demonstrated all the elements as applied in the rejection of dependent claim 31, supra, and Hideo further the plurality of pixels are segmented into the plurality of small areas by a horizontal axis passing through a center pixel among the multiple pixels, a vertical axis passing through the center pixel, and defining the sides of a rhombus whose apexes are the extremities of the horizontal axis and the vertical axis (Figure 4, where a square is a special case of a rhombus).

Thus, it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Hideo into Koyama because Koyama discloses an image display apparatus and Hideo discloses an image correction method by segmenting the display area in order to form a smoother corrected image.

Response to Arguments

26. Applicant's arguments filed 3/28/2005 have been fully considered but they are not persuasive.

As per claims 1, 7, 21 and 27, applicant alleges Koyama does not disclose chromaticity correction without making luminance uniform. In reply, examiner notes the

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Koyama discloses in Figure 15 that "The display information includes a small change component but does not include a large change component, so that nonuniformity on a display portion can be inconspicuous" (column 6, line 7-11). Thus, the correction does not have to make the output luminance look uniform, just the nonuniformity inconspicuous.

Allowable Subject Matter

27. Claims 13-20 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

As per claims 13 and 17, the closest prior art by Hideo does not disclose segmenting a plurality of triangular areas in correcting values of pixels.

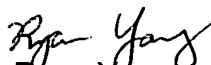
Conclusion

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan R Yang whose telephone number is (703) 308-6133. The examiner can normally be reached on M-F 8:30AM-6:00PM Second Wed Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (703) 305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Ryan Yang
May 6, 2005